



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,277	07/31/2003	Jay Alan Morrison	2003P10694US	3774

7590 06/01/2005

Siemens Corporation
Intellectual Property Department
170 Wood Avenue South
Iselin, NJ 08830

EXAMINER

MAYES, MELVIN C

ART UNIT	PAPER NUMBER
----------	--------------

1734

DATE MAILED: 06/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/631,277

Applicant(s)

MORRISON ET AL.

Examiner

Melvin Curtis Mayes

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13, 20, 21, 23 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20, 21, 23 and 24 is/are allowed.
- 6) ☒ Claim(s) 1, 4 and 5 is/are rejected.
- 7) ☐ Claim(s) 2, 3 and 6-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/25/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

(1)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(2)

Claims 1, 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strangman et al. 6,541,134 in view of Nagaraj 6,485,791 and Halliwell 6,342,272.

Strangman et al. disclose a method of fabricating a ceramic matrix composite having an thermal barrier top coat layer comprising: providing a ceramic matrix composite substrate; coating the composite substrate with a bond coating of silicon nitride and silicon carbide in a binder (ceramic coating); partially entrapping ceramic particles into the bond coating to achieve high surface roughness; heating at 800-1300°C (cofiring); and applying a ceramic thermal barrier top coating layer to the bond coated ceramic matrix composite (col. 1, line 45 – col. 2, line 61). Strangman et al. do not disclose partially entrapping (embedding) ceramic particles in the ceramic matrix composite substrate before applying the ceramic bond coating.

Nagaraj teach that in applying a ceramic coating to a nonmetallic substrate such as a ceramic matrix composite, adhesion of the layer to the substrate surface can be improved by treating the substrate surface (col. 5, lines 47-51).

Halliwell teaches that in applying coatings to a substrate, the substrate as well as the coating may be roughened by well known roughening methods or particles embedded by spraying before applying the coating to the substrate as well as applying a second coating. The

Art Unit: 1734

embedded particles provided roughening in order to effect mechanical interlocking (col. 3, line 36 - col. 4, line 1).

It would have been obvious to one of ordinary skill in the art to have modified the method of Strangman et al. for making a ceramic matrix composite having a ceramic bond coating and a thermal barrier top coating by partially embedding particles in the matrix composite substrate before applying the ceramic bond coating as well as partially embedding particles in the bond coating before applying the top coating, as Nagaraj et al. teach that it is known to also improve the adhesion of a ceramic coating to a ceramic matrix composite substrate by treating the substrate surface and Halliwell teach that one method of improving bonding between a substrate and coating as well as between coatings is to embed particles in the substrate to effect mechanical interlocking. Embedding particles in the composite substrate before applying the ceramic bond coating would have been obvious to one of ordinary skill in the art to improve the adhesion between the composite and coating by roughening the composite and providing mechanical interlocking, as suggested by Nagaraj and Halliwell, similar to the surface roughening provided by embedded particles used to improve the adhesion between the bond coating and top coating as disclosed by Strangman et al.

Embedding the particles in the composite substrate when the composite is in the wet prepreg stage, as claimed in Claim 4, would have been obvious to one of ordinary skill in the art to allow particles sprayed on the composite to embed in the composite substrate.

Art Unit: 1734

Allowable Subject Matter

(3)

Claims 2, 3 and 6-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(4)

Claims 20, 21, 23 and 24 are allowed.

Response to Arguments

(5)

Applicant's arguments, see Remarks, filed 2/25/05, with respect to the rejection(s) of claim(s) under Strangman or DiConza have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Strangman et al. 6,541,134 in view of Nagaraj 6,485,791 and Halliwell 6,342,272.

Conclusion

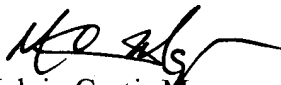
(6)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

Art Unit: 1734

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
May 27, 2005